

THE FISHERMAN RETURNS



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SR June 1973

The Cooperative Extension Service as a part of the University of Alaska conducts educational programs in agriculture, natural resources, human resources (including home economics and youth), and community resource development. Extension information and programs are available to all citizens throughout the state, regardless of race, color, or national origin.

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There's an Alaskan Fish for Every Season

(Check with the local Fish and Game office for seasons and regulations)

Salmon, King or Chinook . . .	February to November
Salmon, Sockeye or Red	June to August
Salmon, Pink	July to August
Salmon, Cohoe or Silver	May to September
Salmon, Chum, Keta or Dog	July to October
Halibut	April to October
Black Cod	All Year
Gray Cod	All Year
Flounder or Sole	All Year
Herring	January to October
Smelt or Eulachon	March to April
Trout, Rainbow and Steelhead . .	April to October
Trout, Dolly Varden	April to October
Redcod, Redrock or Red "Snapper"	All Year
Shrimp	May to February
Crab	April to October
Clams	November to May

Although fresh fish are available at all seasons, interior Alaska and northern regions must depend on preserving the summer surplus for winter use. The salt water bays and inlets of Alaska abound with salmon, halibut, herring, flounder, cod, sole, smelt, rockfish, and shellfish, the fresh water rivers and inland lakes with trout, whitefish, pickerel, and grayling, as well as migrating salmon that return to spawn.

Migrating salmon lose fat rapidly and their texture softens as they move upstream.

Care for the Catch

If you don't know how to dress fish, learn! Practice handling fish quickly and correctly. Fish and shellfish are very perishable.

Keep them cold from the time they come out of the water until you begin processing them, whether canning, smoking or freezing. If ice is not available for cooling, gut and sprinkle the cavity with salt.

Fish caught while feeding will soon become soft and flabby unless cleaned quickly. This is especially true of troll-caught salmon. Fresh water fish have softer flesh than salt water fish, but they too can be preserved if handled properly.

Handling the Catch

Don't let the fish flop around any more than necessary, they bruise easily. Remove the guts and gills immediately and bleed the fish. Hang large fish by the tail to improve bleeding. This delays spoilage and improves color. Don't expose the fish to sunlight any more than necessary. Keep as cool as possible.

Even if cleaned when caught, fish require further cleaning and washing before preserving. Pull the fins off, scrape the fish until it is free of slime and blood, cut off the head and tail and clean any remaining bits of viscera or membranes from the belly cavity.

Scaling can be made easy by using a quick dip in boiling water. It also helps remove the slime, but you must be careful not to cook the fish.

If you do not use hot water, after scaling you can remove the slime by washing in a vinegar-water bath of one part vinegar to three or four parts water. This should be followed by a rinse in clean water.

Preserving

When planning to preserve fish or shellfish:

1. Get suitable containers and equipment ready ahead of time.
2. Preserve only the best quality, absolutely fresh fish and shellfish.
3. Prepare only a canner load at a time.
4. Work fast and follow the directions.
5. Store in a suitable place.
6. Use fish continually from this supply. Don't let it get too old.

In addition to canning and freezing, fish may be corned, brine-cured, dried, dry-salted, smoked, or pickled (vinegar cured).

These methods are simpler and cheaper than canning or freezing. They do not require much equipment, and can be used on varieties of fish that do not can successfully. One disadvantage must be kept in mind, however. These methods do

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not preserve fish indefinitely. In fact, for certain fish and methods, preservation time is limited. Though important, this does not outweigh the many advantages of fish curing. Even when cans and canning equipment are readily available, curing is often preferred to canning.

The purpose of preservation is to prevent spoilage. Fresh, dried, salted or smoked fishery products can be attacked by bacteria. Spoilage takes place fastest at 70 to 100 degrees temperature with lots of moisture. So, it is important to keep fish dry and cold.

You should also keep air and sunlight away from preserved fish. If the surface of home-cured fish is exposed to air or sunlight, it turns yellow to brown and has an unpleasant rancid flavor.

To protect home-cured fish products against spoilage, place in tightly closed containers and keep in a cool, dry place, preferably dark. Brine-cured products should be weighted down below the surface of the brine. Smoked products should be covered with a thin coating of paraffin or wrapped in oiled or parchment paper and put in a tightly closed container.

General Directions for the Pressure Canner

Follow the manufacturer's directions for the use of your pressure canner. If you have no directions, here are a few pointers:

1. Put 2 or 3 inches of water in the bottom of the canner.

2. Set glass jars on a rack. Do not let them touch each other, the sides, or the bottom of the canner. Tin cans can be packed in the canner more closely, but need to be staggered so steam can flow around each can.

3. Fasten the cover securely so no steam escapes except through the open petcock. Watch the canner until steam pours steadily from the opening. Let it escape for 10 minutes so that all the air is driven from the canner. Then close the petcock or put on the weighted gauge. The moment the right pressure is reached, start counting the time. Process for the time given in the directions for canning the product.

4. Keep pressure constant by regulating the heat under the canner. Keep drafts from blowing on it. When time is up, slide the canner away from the heat.

5. **FOR GLASS JARS.** Wait until pressure goes down to zero. Wait one more minute, then

slowly open the petcock or remove the weighted gauge. Unfasten the cover and tilt the far side up so the steam escapes away from you. Take the jars out and place them on a cloth covered table away from drafts. If some liquid in the jars has boiled away, **do not** open to add more. Plan to use this jar sooner than the others. Cool jars right side up. Do not cover with a cloth or try to hasten the cooling. Label the jars with the date and kind of product. Store in a dark, cool place.

6. **FOR TIN CANS.** Release steam in canner as soon as the processing time is up. Open the petcock or remove the weighted gauge. After pressure reaches zero, wait one minute and then unfasten the cover and tilt it away from you to let steam escape. Cool tins in cold, clean water, changing the water as it gets warm. Take the cans from the cold water while still a little warm and they will dry themselves. Label and store in a dry place.

Canning Table

How to Prepare and Pack

If raw, pack flush. For pre-cooked, allow 1/4-inch headspace.

Clams

Whole: Butter, Razor or other hard clams

Minced: Butter, Littleneck or Razor

Scrub well. Place in tub of clean salt water (1-1/3 cups salt per gallon of water). Scatter a few handfuls of cornmeal in brine. Let stand 12 to 24 hours. Open clams. Remove siphon (or neck). Remove guts of razor clams. Do not save the liquor. Blanch clam meats for one minute in citric acid and water solution (1 gallon water, 1/2 teaspoon citric acid crystals). Drain. Grind or pack whole. Steam clams for 10 minutes, and pack in cans or jars; or pack raw and exhaust 10 minutes in pressure cooker.

Time to Process

In Glass Jars — Pack 1½ cups or 12 ounces of meat into pint jar and fill within ¼-inch of top with hot water.

In C-enamel Tins — Pack 1½ cups of meat into No. 2 tin and fill with hot water.

Seal containers, and process at 15 pounds (250°F.) for 75 minutes.

See questions 3, 4, 5, 6 on inside back cover.

New England Clam or

Fish Chowder

Flesh from backbones, heads or other portions of fish may be utilized. The amounts in the formula given here are sufficient for one dozen No. 2 cans or pint jars.

5 lb. diced potato	2 qts. fish broth*
9 cups clams or 5 lb. boned fish (edible portion)	2 tbs. salt
¾ lb. salt pork (fat back)	½ tsp. pepper
¾ lb. chopped onion	½ cup flour

*Fish broth is obtained by cooking edible scraps of fish in water in the proportion of about four pounds of scraps to one gallon of water. Backbones and heads or other portions of fish may be utilized. The mixture is allowed to simmer for two hours, after which it is strained and the scraps discarded.

Grind the pork and onions, then cook them together in a preserving kettle until they are soft, but not brown.

Beat the flour slowly into the fish broth until a smooth, milky liquid is obtained. Add this to the kettle together with the salt and pepper, and simmer contents to boiling point.

Fill ¾ cup of diced potato and ¾ cup of fish into each No. 2 can or pint jar. To prevent discoloration, potatoes should be blanched immediately after dicing or kept in water until needed. Some canners find it better to steam the fish in a pressure cooker and then flake it than to use raw fish.

After adding the fish and potatoes, fill each container with hot fish broth and seal immediately.

This is a concentrated chowder. Dilute with an equal quantity of milk when heating for serving.

Time to Process

Pint jars	90 minutes at 10 pounds
No. 2 tins	80 minutes at 10 pounds

Crabs

Put live crabs in ice water for 2 minutes. Kill with knife. Remove claws and legs. Remove back shell by putting fingers into leg holes and pulling apart. Remove viscera and wash carefully in several waters.

Bring to a boil a large preserving kettle of water to which ¼ cup of vinegar and one cup of salt per gallon have been added. A few whole black peppers and bay leaves may be added for seasoning, depending upon individual preference.

Boil the crabs for about 20 minutes, counting from time water again begins to boil after the crabs have been put in it. Pick meat out of shells as soon as possible after cooking. In picking, break claw and leg shells with a small mallet and

peel off the broken pieces, taking care not to break the meat unnecessarily.

Cut body in two with a sharp knife, as if slicing a bun, and pound shell against pan in which meat is to be picked. This loosens and releases the meat without breaking it into small pieces.

The body and leg meat are about equal in quantity and should be kept separate. Immerse picked meat for one minute in a brine made of one cup of salt to each gallon of water. Then dip in a mixture of one cup vinegar to one gallon water. Press the meat with the hands to remove extra moisture.

In Glass Jars — Place about ¾ cup or 6½ ounces into half pints, 1½ cups or 13 ounces in pints. A layer of leg meat in the bottom, around the sides, and on top with body meat in the center is a good pack. Process.

In C-enamel Tins — Half-pound flat, pound No. 300 tall, or No. 2 C-enamel lined cans may be used, and the usual practice is to put in a lining of vegetable parchment paper as additional protection. In filling, place a layer of leg meat on top. Clinch covers loosely and exhaust cans for 10 minutes at boiling temperature. Seal and process.

Time to Process

½ Pint jars	80 minutes at 5 pounds
Pint jars	100 minutes at 5 pounds
½ Pound flat tins	70 minutes at 5 pounds
No. 300 tins	75 minutes at 5 pounds
No. 2 tins	80 minutes at 5 pounds

Halibut, Gray Cod, Rock Fish, Large Flounder or Sole

Fillet fish and remove the dark, fatty portions. Cut the fillets into can or jar size pieces. Prepare brine of 1⅓ cups salt to one gallon water. Add the cut pieces to the brine solution and soak for 10 minutes. Remove and drain for five minutes. Pack tightly in containers, leaving ¼-inch head-space.

Place the open containers in the pressure canner and steam for 10 minutes for the half-pound flat tins and 20 minutes for the pint jars. Remove from canner. Drain off the liquid and add: 2 tablespoons oil (any salad oil) to each pint jar, or 1 tablespoon oil to each half-pound flat tin. Seal the cans immediately.

Time to Process

½ Pint jars	85 minutes at 10 pounds
Pint jars	95 minutes at 10 pounds
½ Pound flat tins	75 minutes at 10 pounds
No. 2 tins	90 minutes at 10 pounds

Halibut Cheeks Canned in Jelly

Get the halibut cheeks from selected halibut. Avoid those that have been gaffed, bruised or clubbed. The coagulated blood will spoil the delicate flavor. Fresh halibut cheeks are best, but selected frozen cheeks can be canned if they have been carefully frozen without darkening.

Can in half pound flat C-enamel cans. Prepare halibut cheeks as for canned fillets of halibut. After draining off hot liquid, add 1 ounce (2 tablespoons) jelly solution*, sufficiently hot to run through the fish. Seal and process as for other canned halibut.

*Jelly solution: 1½ teaspoons powdered agar-agar (obtained from the drug store) and 8 level teaspoons plain gelatin dissolved in 1 cup hot water.

Oysters

Wash absolutely fresh oysters. Place in metal baskets or pans and steam in pressure cooker for 5 minutes at 10 pounds pressure or in a non-pressure steamer for 15 minutes. Shuck meats immediately into a salt solution (2 tablespoons salt per quart of water) to prevent darkening. Drain 5 minutes.

If oysters are opened by hand, save liquid, wash meat well in plenty of water or brine so sand or grit is removed. A wire basket for oysters makes it possible to lift oysters out easily and sand sinks to the bottom of the container. Drain oyster meats and fill into containers. Weigh amounts if possible:

8 ounces or 1 cup for ½ pint jar.

16 ounces or 2 cups for No. 2 can or pint jars.

Add brine (2 tablespoons per quart of water). Exhaust for 5 minutes, and seal.

Time to Process

½ Pint jars 35 minutes at 10 pounds

Pint jars 50 minutes at 10 pounds

½ Pound flat tins 29 minutes at 10 pounds

No. 2 tins 42 minutes at 10 pounds

Salmon

Remove scales, fins, and head. Clean and wash thoroughly. Leave backbone. Cut into can-length pieces. Soak in brine (1 cup salt to 1 gallon water) for 1 hour. This will do for 25 pounds of salmon. Drain for several minutes and fill container. Pack solidly but do not crush.

In Glass Jars — Seal and process.

In C-enamel Tin Cans — Crimp lid loosely and steam 15 minutes. Complete seal and process immediately.

Time to Process

Pint jars 100 minutes at 10 pounds

No. 2 tins 100 minutes at 10 pounds

Smoked Salmon

Smoking followed by canning is a favorite method of preserving salmon. Fillet salmon, soak in a brine solution (2/3 cup per gallon water).

Most people do not like too strong a smoke flavor and since canning intensifies the smoke flavor, salmon fillets for canning should be cold-smoked only 2 to 3 hours or until light brown.

The fillets are then cut in can lengths, packed in the can, sealed, and processed the same as fresh salmon. It is recommended that smoked salmon be canned in C-enamel (seafood formula) cans. The cans and jars should be cooled well in air before storing.

Time to Process

½ Pint jars 95 minutes at 10 pounds

½ lb. C-enamel flat tins . . 90 minutes at 10 pounds

No. 2 C-enamel tins . . . 100 minutes at 10 pounds

If a stronger smoke flavor is desired, salmon can be hot-smoked or kippered until a golden brown. The fillets may then be sliced, packed in the can, and covered with a small amount of vegetable oil, such as cottonseed or soy bean oil. Even though the salmon are actually cooked before canning, the full process time for sterilization must be used for shelf storage at room temperature. Only then can the housewife be sure that no harmful bacteria (botulinus) is present.

Shrimp

Plan to pack only near the place where shrimp are taken. They spoil very quickly.

Head as soon as removed from water. Sand vein or black streak comes off with head if done within 30 minutes. Pack in fine ice as headed to make shell removal easy and to keep shrimp. Wash thoroughly, sort for freshness, and peel. Discard strong smelling, bloody, and flat-colored shrimp. Wash in fresh water.

Place not more than 35 pounds of meats in galvanized metal container and cover with cold brine (½ cup salt to 1 quart water) for from 20 to 30 minutes, depending upon their size. Stir shrimp occasionally so brining will be uniform.

Drain meats and place in wire baskets of type used for deep fat frying. The basket should be

not more than half full. Fill a large preserving kettle with brine in proportions given above. Bring brine to a boil and lower basket of shrimp meat into it. Cook for 6 to 8 minutes, counting time from when brine again begins to boil after shrimp have been put in.

Brine can be reused, but it will be necessary to add salt in the proportion of 1 tablespoon to each quart of brine after each batch is blanched. The brine should be discarded entirely and replaced by a fresh lot after each five batches; otherwise, the canned shrimp will be ragged and the liquid in which they are canned will be "ropy."

Spread blanched shrimp on a wire-mesh screen, tray, or rack to dry and cool. An electric fan shortens cooling time. Bits of shell and whiskers missed in peeling and washing may be removed at this time. Meats must be cool and show no traces of surface moisture before filling into containers.

$\frac{3}{4}$ cups into $\frac{1}{2}$ pint jar.

$1\frac{1}{2}$ cups into No. 2 can or pint jar.

Fill containers with scalding brine ($1\frac{1}{2}$ table-
spoons salt to 1 quart water) and seal immediately.

In Glass Jars — Pack and process immediately.

In C-enamel Seafood Formula, or Plain Tins
with Parchment — Pack and process immediately.

Time to Process

$\frac{1}{2}$ Pint jars 25 minutes at 10 pounds
Pint jars 35 minutes at 10 pounds
No. 2 tins 30 minutes at 10 pounds

Spiced Fish

Salmon, shad, mackerel, trout, or lake trout may be used. Scrape off all scales, remove fins and heads, clean, and wash fish thoroughly, but do not take out backbones. Cut cleaned fish into can-length pieces and soak these in brine, in the proportion of $\frac{1}{2}$ pound of salt to 1 gallon of water for 1 hour. Drain fish for about 10 minutes.

Vinegar Sauce

2 quarts vinegar	$\frac{1}{4}$ ounce whole cloves
1 quart water	$\frac{1}{8}$ oz. cracked cardamom
2 ounces ($\frac{1}{4}$ cup) sugar	seed
$\frac{1}{4}$ oz. whole white pepper	$\frac{1}{8}$ oz. bay leaves
$\frac{1}{4}$ oz. mustard seed	$\frac{1}{8}$ oz. cracked whole ginger

Add sugar and water to vinegar. Tie spices loosely in cheesecloth and simmer in vinegar solution for 1 hour. Strain.

Fill containers, but pack rather loosely and add $\frac{1}{2}$ strength vinegar sauce. Exhaust in both tin cans and glass jars by cooking in open can or jar for 20 minutes.

Invert the containers on a wire screen and drain for about 3 minutes. Right the containers and add a slice or two of raw onion, a bay leaf, a few mixed spices, and enough fresh vinegar sauce, full strength, to cover fish. One tablespoon olive oil may be added if desired.

In Glass Jars — Pack and process.

In Plain Tin Cans — Pack, clinch loosely. Exhaust for 10 minutes, seal, and process.

Time to Process

$\frac{1}{2}$ Pint jars 90 minutes at 10 pounds
 $\frac{1}{2}$ Pound plain tin 80 minutes at 10 pounds

Trout, Smelt and Perch

Remove scales, fins, and head. Clean and wash thoroughly. If large, cut in slices. Pack vertically. Add salt, but no water.

In Glass Jars — Seal and process.

In C-enamel Tin Cans — Crimp lid loosely and steam 15 minutes or until fish is 170° F. before sealing.

Time to Process

Pint jars 100 minutes at 10 pounds
No. 2 tins 90 minutes at 10 pounds

Tuna

Clean fish thoroughly, scraping off all scales and slime and remove intestines. Cut away strips of thin belly $\frac{1}{2}$ to $\frac{3}{4}$ inch wide and discard. Wash and drain.

Cut as necessary to place in perforated pans. Steam in pressure cooker 2 hours at 10 pounds. Cool several hours or overnight. Scrape away skin with knife edge, lift out backbone, cut away streaks of dark flesh along sides.

Cut white meat in sections $\frac{3}{4}$ inch shorter than length of container. Put 1 teaspoon salt in each container. Pack with meat. Add 2 tablespoons olive oil or cottonseed oil.

$\frac{1}{2}$ Pint jars or $\frac{1}{2}$ pound flat tin cans recommended only.

In Glass Jars — Pack and process.

In C-enamel Tin Cans — Pack and clinch can lids loosely. Steam for 10 minutes and seal cans. Process.

Time to Process

$\frac{1}{2}$ Pint jars 80 minutes at 15 pounds
 $\frac{1}{2}$ Pound flat tins 70 minutes at 15 pounds

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General Directions for Freezing Fish

U.S. Department of Agriculture Home and Garden Bulletin No. 93, "Freezing Meat and Fish in the Home," pages 14-17, has excellent illustrations and information on cleaning, dressing and wrapping fish for the home freezer. Ask for a free copy from your nearest Extension office.

Whole or Cut?

Decide how you want to serve the fish. Leave them whole for baking or boiling, or cut in chunks, steaks or fillets depending on the way you want to cook and serve them.

Package

All your work is wasted if packaging is poor. Use only good quality, new, freezer packaging material. Heavy aluminum foil is good, so is laminated frozen meat wrapping paper. Polyethylene sheets and bags are moisture-vapor proof too, and when covered with stockingette for added protection the package is easy to handle. Freezing jars and tins can be purchased. These are best for freezing but take the most room in the freezer and cost the most.

Add some moisture in the package. Wrap loosely in vegetable parchment paper dipped in cold water before wrapping in the moisture-vapor proof paper, or dip fish for 30 seconds in a salt solution ($\frac{2}{3}$ cup salt in 1 gallon of water), before putting it in the freezer wrapping material. Commercial fisheries glaze fish before storage. They dip the frozen fish in ice water and freeze it again. A second dip follows to thicken the glaze. The fish is then wrapped or packaged in moisture-vapor proof material. Do not tear, puncture, or scuff the package after it is wrapped. Handle each package carefully before and after freezing. If air gets to the fish, the oxygen quickly causes rancidity.

Freeze

Spread packages to freeze. Turn control to coldest position (0° or lower) so the fish will freeze quickly.

Store

Frozen fish should be zero (0° F.) or colder. How long fish will keep depends on the kind of fish. Lean fish keeps longer than does fat fish. If handled well and packaged properly, fish may keep up to nine months. Usually three to six months is proper storage life of fish. Fish in vacuum glass or tin containers will keep longer.

If only fresh fish are frozen and they are adequately protected, there will be no odors of fish in the freezer. Absorption of fish odor by butter or other foods in the freezer means that the packaging material is not keeping the air out or that stale fish were frozen.

Refreeze?

Fish is such a perishable food that refreezing breaks the cells and causes a loss of texture and if thawed completely before refreezing, the flavor will be affected.

Home Freezing of Shellfish

It is more work to prepare shellfish for freezing. They are in prime condition except during spawning.

Clams may be full of green algae, which gives them a strong flavor, during the spring months. Clam season, for commercial purposes, is closed from mid-April through mid-September, but they may be taken for personal use at any time of the year.

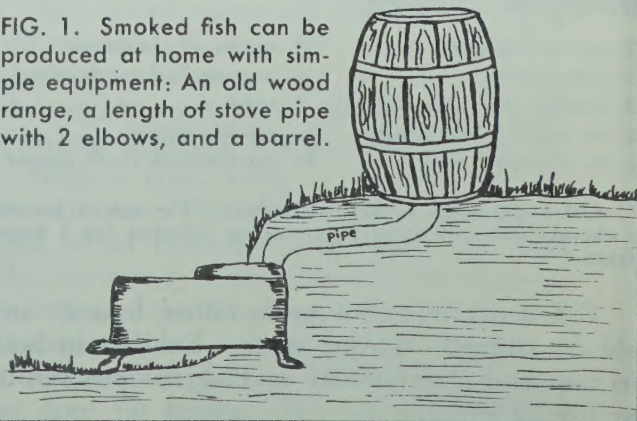
Oysters, clams, scallops, shrimp and crab can all be successfully frozen. Prepare them as for canning, and after draining, pack in glass or plastic containers and cover with brine solution ($\frac{2}{3}$ cup salt in one gallon of water). Seal and freeze.

An exception to the above is shrimp which can be frozen either raw or cooked. After breaking off the head and appendages, but without removing the shell, the tails or edible portions are washed and packed in glass jars with some brine solution as above. Freeze at 0° F. or lower. Use frozen shellfish within four months. Storage life of six months is possible with -10° F. storage temperature.

Smoking Fish

Fish are smoked as a means of preserving the meat, but also for the pleasant taste contributed

FIG. 1. Smoked fish can be produced at home with simple equipment: An old wood range, a length of stove pipe with 2 elbows, and a barrel.



by the smoke. Smoked fish is cooked fish and subject to spoilage even under the most sanitary conditions. Refrigeration must be used to extend the storage life of most smoked fish. Canned or frozen smoked fish is a great delicacy and can be produced at home with simple equipment. See Figure 1.

Smoking Salmon for Canning

Dress fish as usual. Split dressed fish on either side of backbone, removing the backbone. Remove gills but leave the bony plates to support the weight when hanging in the smoke-house. Rinse with fresh water to remove blood, slime, and waste material. Score the fish, cutting several slits in the skin to improve salt penetration.

Make a saturated brine solution by adding 6 cups salt to 1 gallon of clean water (it will float a potato). Use a clean plastic container or crock.

Immerse the fish in the brine and let stand for 30 minutes to 1½ hours, depending on size of the fish or thickness of the pieces. The sides from a 15 to 20 pound fish must be brined approximately 1 hour.

Remove from brine and rinse lightly with fresh, cold water, just enough to remove salt from surface. Drain well. Blot surface with clean paper towels and let dry until surface is dry and shiny. Moving air will do this in 15 or 20 minutes.

If you wish a dry salt or mild cure fish for

smoking, the fish must be freshened by placing in cold running water overnight, or for approximately 15 hours after brining. Drain and dry as above.

There are two methods of smoking salmon — by cold smoke or by hot smoke. A light cold smoked flavor is best for canning because the canning process intensifies it. Any non-resinous wood, such as alder, may be used for smoking.

Cold Smoked:

Smoke 4 to 7 hours, depending on the size of the fish, in cool dense smoke (not over 100° F.) or until the surface is light brown.

Hot Smoked (kippered):

Smoke 3 to 5 hours, depending on the size of the fish, gradually raising the temperature of the smokehouse from 160° to 190° F., or until fish are cooked and have a light brown surface color.

If you wish to can smoked fish, the next step is to cut into can-height pieces.

Pack as for plain salmon, omitting salt. One-half pound flat cans are preferred. If desired, add one tablespoon of vegetable oil per can.

Follow directions for use of pressure cooker. Exhaust same as for plain salmon. Process one-half pound flat cans for 90 minutes at 240° F. (10 pounds pressure).

Making a Smokehouse

A simple plywood smokehouse was designed and constructed by personnel of the Pascagoula

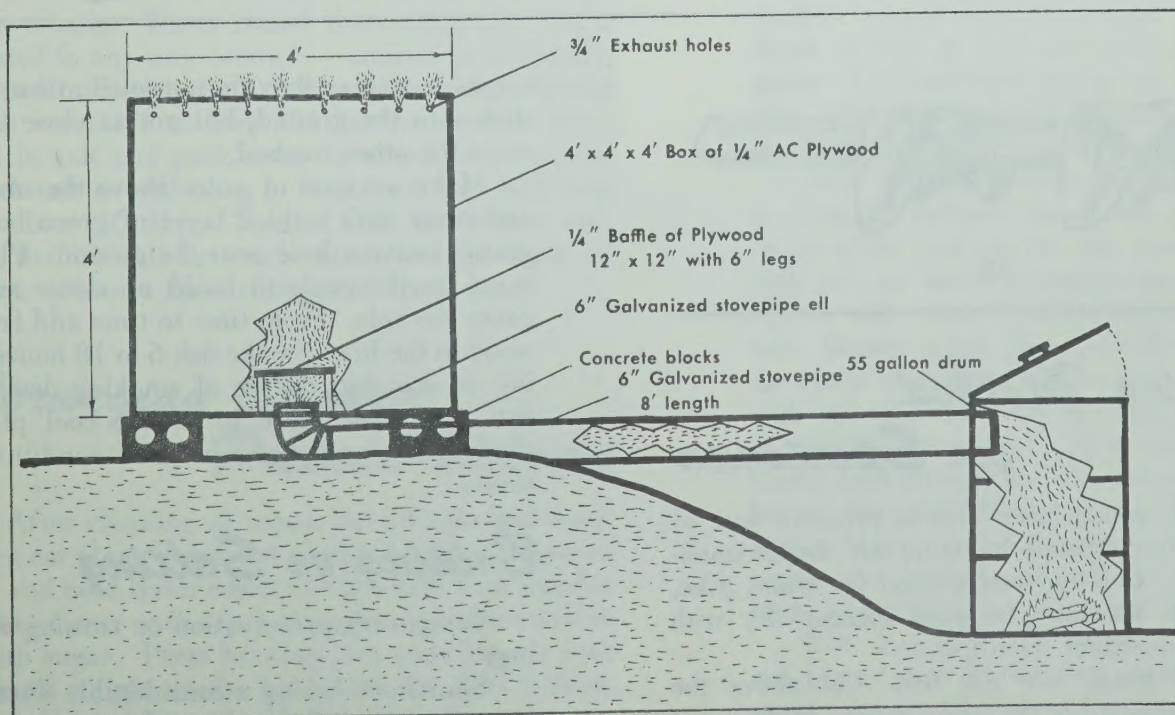


FIG. 2. Side view of smokehouse and firebox.

Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The 4' x 4' x 4' smoker was built by unskilled labor in 16 hours. The firebox is a 55-gallon drum with removable clamp-on lid and a door cut out near the bottom for feeding wood. A stovepipe runs from the drum to the smokehouse, and a baffle is placed over the stovepipe opening to disperse the smoke inside the house. Exhaust holes in the sides, back and front near the top allow the smoke to escape. Wood sealer is applied to the outside to prevent warping, and removable trays slide on wood runners.

Methods of Hanging Fish for Smoking

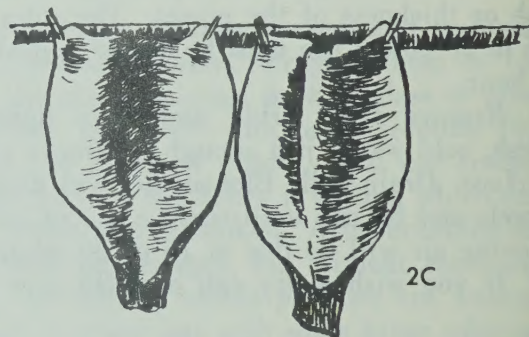
Small fish may be hung on one or more S-shaped hooks, (See Fig. 2B) or if split, on two rods run through flesh beneath the bony neck-plates. (See Fig. 2A). Figures 2C and 2D are other ways of hanging filleted or split fish for smoking.



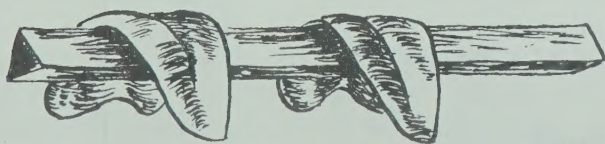
2A



2B



2C



2D

Smoking Method for Sportsmen

Sport fishermen may wish to preserve part of their catch immediately by using this simple smoking method. It is especially good for trout, pike, or pickerel, but may be used successfully with almost any medium sized fish.

Cut off heads and gut fish. Cut above the backbone almost to the tail; make another cut below the backbone and break off, leaving about

1/5 of the tail section uncut so the fish lies flat in one piece. Score the fish lengthwise from head to tail, cutting 1/4" deep slashes about 1" apart. Wash fish thoroughly. Wipe dry and rub inside and out with a mixture of 1 ounce pepper to 1 pound salt.

Store fish overnight in a cool place. Next morning rinse thoroughly. Spread fish open using several thin, flat sticks pointed at the ends to pierce the skin. Use two or three across the back of the fish. Hang in the breeze about 3 hours until fish dries and a thin surface skin forms. See Fig. 3.

While the fish dries, dig a shallow pit about 3 feet wide and prepare a bed of red coals. Hardwood fuel such as birch, aspen, or alder may be used. Fasten each fish to the forked end of a stick 4 to 5 feet long. Thrust the other end into the ground so it hangs over the coals at an angle. Place sticks far enough apart so fish do not touch.

A second method is to fasten two or three fish

across a stick so they do not touch, then thrust the stick into the ground, but not as close to the fire as in the other method.

Make a tripod of poles above the smoke-sticks and cover with a thick layer of green boughs and grass. Leave a hole near the ground. Place green wood on the coals to build up dense smoke and cover the hole. From time to time add fresh green wood to the fire. Smoke fish 6 to 18 hours, depending on size and degree of smoking desired. Cool fish, wrap and store in a dry, cool place. The smoked fish will keep in good condition 2 to 4 weeks.

Brining or Salting

Temporary preservation or corning while fishing:

Sportsmen fishing a considerable distance from home frequently bring home fish in poor condition and throw them away. Such waste can be avoided



FIG. 3

if a few precautions are taken. Carry with you a mixture of salt and pepper (1 tablespoon pepper to 1 cup salt).

Clean fish as usual and rub cavity well with the salt and pepper mixture. Rub some into the skin, too.

Place the fish in a basket or box with a loose packing of green leaves around the fish. Cover the container with several thicknesses of burlap. Leave an air space between the burlap and the fish. Moisten it and keep it moistened as evaporation lowers the temperature in the container.

Treated in this way, the fish should remain in good condition for at least 24 hours, or until ice is available. When rinsed thoroughly the fish is treated in any way desired — cooked immediately, canned or frozen, or brined and smoked. Should it be necessary to keep the fish for several days, roll in salt and pack away in a container with as much salt as will cling to them and they will keep for about 10 days. Treated with this heavy salting, the fish will have to be freshened for about 12 hours in two or three changes of fresh water.

Norwegian Smoked Pressed Salmon

After cleaning as usual, cut off tail and head. Then cut along spine and remove backbone. Spread flat and hold down edges of back skin with wooden picks. Cover with salt and sugar — 1 quart salt to 1 cup sugar. Press between two wide boards with a small weight on the top board for 2 to 3 days, depending on the size of the salmon.

Remove the salt mixture with a cloth. Wash

fish with 1 teaspoon saltpeter dissolved in $\frac{1}{4}$ cup of brandy or water. Smoke for 8 hours in cool alder smoke. Let salmon hang for about 6 days before use.

The backbone, head, and tail can be cooked and the meat removed and used separately.

Brine Salting

The family salting 50 pounds or less of salt fish needs no special equipment except a sharp knife and a 2 to 4 gallon container. This may be a stone crock, a wooden barrel or a tub or a plastic container such as a new plastic garbage can with a lid.

Salt should be as pure and as clean as can be purchased. It should be free from carbonates or magnesium. Dairy salt is good.

Lean fish are salted more easily than oily fish. The salt brine penetrates it better and it doesn't become rancid so easily. However, if oily fish are well salted, they are of the finest quality. Both salt water and fresh water fish can be brine salted.

The method of brining is the same for all varieties. Smaller fish are split down the back so as to lie flat. Large fish are split into two fillets, removing the backbone. The gills are always removed but the collarbone just below is not cut away. The collarbone is needed to support the weight of the piece when handled, especially if the brined fish is to be smoked. Without this, the piece will drop from the smokehouse hangers during the smoking.

For good penetration of salt, the flesh of the thickest pieces may be scored lengthways to a depth of half an inch and from one to two inches apart. Cut carefully so as not to penetrate the skin. The pieces should be cut only large enough to lie flat on the bottom of the crock or container.

After the fish is cleaned, and soaked in brine to draw off diffused blood, the pieces are left to drain while you get the salt ready. Use a large dish pan or make a shallow box about two feet square with sides 6 inches high and fill with dry salt. Scatter a thin layer of salt on the bottom of the crock or container. Dredge each piece of fish with salt and rub some salt into the scored places in the heavier pieces. Pack with the skin side down and arrange so the pieces make an even layer. See the illustration in Figure 4. Scatter a thin layer of salt over each layer of fish and repeat the dredging of fish and arrange the next layer at right angles to the one below.

With large fish the pieces with the backbone are placed next to the wall of the container. An extra piece may be placed in the middle, to level the layer, if needed. The pieces should overlap



FIG. 4

each other as little as possible. Small fish are packed in a ring with the tip of the head touching the walls of the container. It may be necessary to lay one or two fish across the center to keep the layer level. Stagger successive layers so that each fish rests on two fish of the layer below. Scatter salt between each layer. **The top layer of fish, both large and small, should be packed skin side up.** See Fig. 5.

The amount of salt to be used depends on the season of the year, the size and fatness of the fish and the probable length of preservation. A general rule is to use one part of salt to three parts fish. Add a little for especially fat fish and for preserving for a long period of time without refrigeration, smoking or in hot weather. Remember that an excess of salt will "burn" the fish and lower the quality.

Place a loosely-fitting wooden cover or china plate on the top layer of fish and weight the cover down with fair-sized rocks or bricks — well-washed for this purpose. The fish will form its own brine. Small fish will be completely brined in 48 hours. Thicker and fatter fish will require a week or eight days.

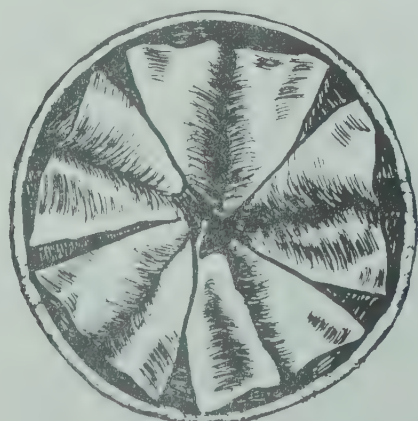


FIG. 5

At the end of this time, the fish are removed, scrubbed in fresh saturated brine (6 cups of salt to 1 gallon of water) with a stiff brush and then smoked or repacked with a very light scattering of salt between the layers. Fill the crock or container with a fresh saturated salt brine and store in a cool, dark place. After three months, or at the first sign of fermentation, change the brine again. **Do not keep longer than nine months.**

Dry Salting

Properly dry-salted fish will keep longer than brine-salted fish. The fish are prepared as described for brine-salting on Page 8, and filleted and scored if large. Small fish should be split down the back. The fish are cleaned and drained before dredging with salt.

After salting, stack the fish in rows on a rack, choosing a place where the brine formed will run away. First, scatter a thin layer of salt on the place where the fish are to be stacked. Alternate the fish heads and tails and scatter a little salt between the layers. Fish are piled flesh side up, except for the last layer which is laid skin side up. The average amount of salt used is one part salt to four parts fish.

The fish are taken out of salt after 48 hours or in one week, depending upon the size and the weather. In damp or stormy weather they are allowed to remain in salt longer. Less time is required for salting in warm weather.

When the fish are ready for drying, they should be scrubbed in brine to remove all excess salt. No traces of salt should be visible. Drain for 15 or 20 minutes before arranging on the drying racks.

Drying racks are roofed over frames of wood covered with chicken wire and standing on legs about four feet high. A slat top of thin poles or laths two inches apart may be substituted for the wire mesh. See Figure 6.

Fish should be kept shaded at all times during drying. A breezy location should be chosen if possible. If only a few fish are being dried, they may be hung under a wide overhanging eave, or from the rafters of a shed or barn where there is good cross ventilation. See Figure 7.

If placed on racks, the fish are laid skin side down but should be turned three or four times the first day. The fish are gathered up and stored each night to prevent molding and decay where dew is heavy. The fish are stacked heads and tails on floor racks as before and covered with a weight at least as heavy as the fish, to press out further moisture. No stack should be more than two feet high. If at any time the weather is unfavorable and the fish cannot be put out to dry, repile each day

with the top fish at the bottom and the bottom fish at the top of the pile. If several days are bad for drying added salt may be needed.

A smoke or smudge under the drying racks may be necessary, for the first day at least, to keep the flies away. The smudge should always be of "green" deciduous leaves and branches to make a heavy smudge. Evergreens give off a resinous smoke.

The usual test for dryness is to press the thick part of the flesh with the thumb and forefinger. If no impression can be made, the fish are sufficiently dried. The cured fish are wrapped in waxed paper, packed in a thin wooden box, tightly covered, and stored away in a cool, dry place. At the first sign of rust, mold or reddening, scrub the fish off in a salt brine and dry in the air for a day or two.

Spiced and Pickled Fish

To preserve fish in vinegar and brine with different spices is another way of providing variety. Pickled fish can be eaten either raw or cooked. If the solutions are the proper strength, the fish keeps indefinitely.

Spiced Herring

Prepare 25 pounds of herring. Clean, remove backbone and fins and wash well. Pack in a crock and cover with vinegar and let stand for 24 hours. Mix well:

1 1/4 pounds salt	1 ounce long-pod peppers
3/4 pound sugar	1 ounce chili pepper
1 ounce cinnamon	1/2 ounce hops, or 30 drops
1/2 ounce Allspice	oil of hops
1/2 ounce cloves	1 qt. onion, sliced thinly
1/2 ounce white pepper	

Remove fish from the vinegar and let it drain. Place a layer of herring in the scalded crock and sprinkle with the salt and spice mixture, adding a few slices of onion. Continue layering until all fish are used. Weight the fish with a clean plate or board with a weight on top to keep all the fish under the brine that will develop. The fish is ready for use after 4 or 5 weeks and will keep in a cool place all winter. Serve as it comes from the crock without washing it.

Pickled Herring (Norwegian Style)

Clean 8 medium herring and cover with 1 quart brine (1/4 cup salt to 1 quart water) for 30 minutes. Remove from the brine and wipe dry. Place in a crock with alternate layers of fish and a mixture of:

1 onion, sliced	a few whole cloves
1/4 lemon, sliced	2 bay leaves
1 tsp. whole peppers	1/4 tsp. Allspice

Cover with 1/2 quart vinegar and 1/2 quart water solution. Place the crock in a kettle of cold water and bring it to a boil. The herring is ready to use when the meat drops from the bones. Chill and serve cold.

Pickled Salmon

Simmer or steam in salted water (1 tbsp. salt to 1 quart water) a 4-pound chunk of salmon in a cheesecloth for 45 minutes. Drain, and keep 1 cup of the cooking water and add 2 cups of vinegar, 1 ounce whole pepper, 1 1/2 ounces nutmeg (grated fresh is best), and 1 ounce mace. Cook 5 minutes and cool. When cold, pour over the cold salmon

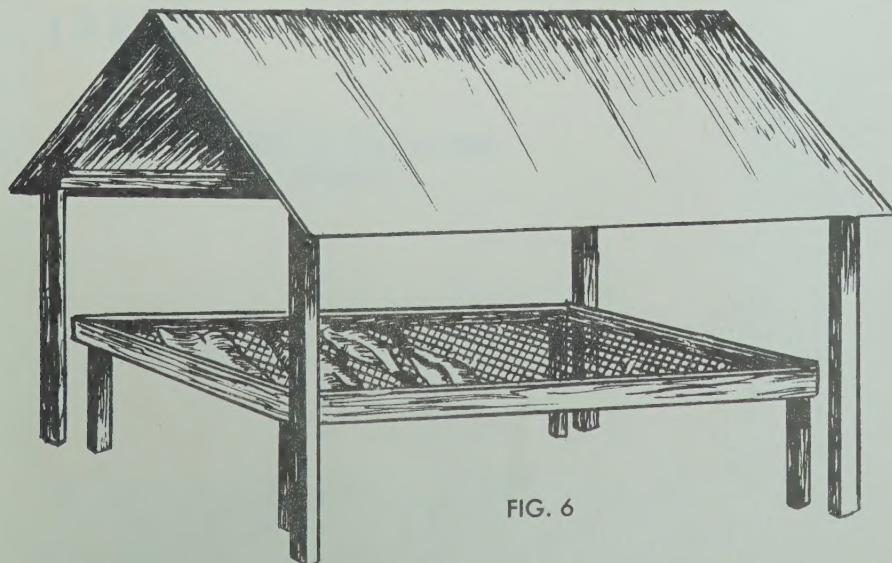


FIG. 6

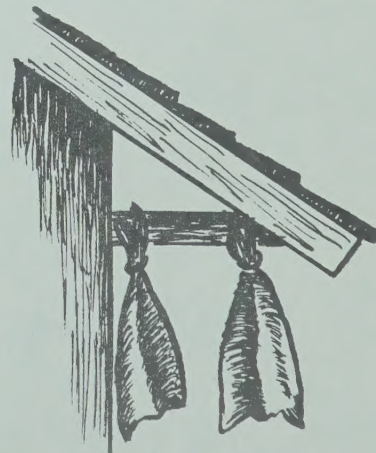


FIG. 7

and add 2 tablespoons of salad oil. Cover, and store in a cool, dry place. The pickled salmon will keep for several months.

Spiced Salted Herring

Clean 5 salted herring and soak for 2 to 3 hours in equal parts of milk and water and drain. Remove backbones, heads and fins and cut in convenient size pieces ($\frac{1}{2}$ - to 1-inch slices) and place in jars with alternate thin slices of onions. Mix and bring to a boil, only:

1 cup vinegar	$\frac{1}{4}$ cup sugar
$\frac{1}{3}$ cup salad oil	3 bay leaves
$\frac{1}{3}$ cup water	$\frac{1}{2}$ tsp. whole pepper

When cool, pour over the herring in the jars, and seal. The herring are ready to serve after 24 hours and will keep for several weeks.

Herring Anchovies

Clean herring, remove backbone, head and fins. Cut in 2-inch lengths, enough to make 2 quarts of herring, soak in a heavy brine (1 cup salt to 2 cups water). Mix well:

2 tbsp. salt	1 tsp. hops
1 tsp. cloves	2 tbsp. sugar
2 tbsp. pepper	a few bay leaves

Alternate drained fish and salt mixture in a crock or canning jar. Seal. Ready to use after 3 weeks.

Canned Fish Balls

- 1 medium salmon or other salt water fish (about 10 lbs.)
- 1 small onion
- 1 button garlic
- 1 tbsp. salt (or more to taste)
- 1 tsp. white pepper (or more to taste)
- 1 tsp. mace
- 3 eggs
- 3 cups water (or more to make a paste)

Fillet the fish. Put fish bones and head in a kettle with enough water to cover them. Cook slowly while you prepare the fish balls. Put the fillets, onions and garlic through a food chopper, twice. Use the fine blade. Add the salt and seasonings and stir or mix well with a wooden spoon or the hands. Add one egg and 1 cup water at a time and work into a smooth paste. Repeat, adding one egg and 1 cup water until the 3 eggs and 3 cups water are used. Add more water if needed. Shape into balls.

Strain the bones from the fish stock. Bring it to a boil. Drop the fish balls into the boiling stock a few at a time and cook for 10 minutes. Pack fish balls in tins or cans to within $\frac{3}{4}$ -inch of the top. Fill with the boiling stock. Seal and process in the pressure canner for 60 minutes at 10 pounds of pressure.

To serve, make an egg sauce of the broth and serve over the heated fish balls.

Questions and Answers

1. What causes discoloration (gray and blue) in canned crab and lobster? How to prevent it?
 - a. Caused by blood and viscera of the crab not thoroughly cleaned from meat before processing it, and a combination of iron from the can and sulfur from the meat.
 - b. To prevent, dip crab meat in acid solution (acetic, ascorbic or citric) before packing.
 - c. If crab is alive when butchered and meat is carefully washed and cleaned before packing, there is no need for the acid dip.
 - d. Use C-enamel cans.
2. Are clams good to eat all year around in Alaska?
 - a. Yes.
 - b. In the spring they may be full of green algae and strong flavored.
 - c. April to September is closed season, commercially, to protect clams during the spawning season.
 - d. See local regulations for taking clams, crab or shrimp.
3. What is "clam toxicity" or poisoning?
 - a. Atlantic, Pacific and Alaska clams may contain certain toxic substances, commonly called PSP (Paralytic Shellfish Poison). In some parts of the country "red tides" are linked with clam toxicity. However, research indicates that neither red tides nor a lack of them is dependable in determining the absence of poison in Alaskan clams. Butter clams may be poisonous up to two years after being exposed to toxin producing organisms.
 - b. Most of the toxin usually is in the neck or the siphon of the clams. Cut this part off and throw it away. By the way, don't feed it to the cat if you like her. She is highly susceptible to this poison. Eviscerate razor clams. Do not save clam liquor.
 - c. Do not eat raw clams AT ANY TIME.
4. Where are "safe" clamming beaches?
 - a. The Alaska Department of Fish and Game and the State Department of Health and Social Services cooperate in examining and monitoring beaches for safety. Check with either of these local offices for current information in your area.
5. Is it necessary to use a pressure canner in canning seafood?
 - a. Yes.
 - b. Pressure is necessary to produce temperatures above boiling (212°F.) that is needed to kill the spores of Botulinus. This food poisoning is fatal in 3 out of 5 cases. Ten pounds of pressure (240°F.) will destroy these spores. Fifteen pounds of pressure (250°F.) is necessary to destroy PSP.
6. Where can I get more information about PSP and clams?
 - a. The Environmental Health Section of the Alaska Department of Health and Social Services has prepared paper No. 1 "Anyone Interested in Alaskan Clams Should Read This." Copies are available from the Cooperative Extension Service at Fairbanks.
7. What temperature is needed to keep canned fish in good condition?
 - a. Canned fish should be kept at room temperature or lower. Store it on the low shelves in the kitchen, as high shelves are warmer.
8. What happens if canned fish is frozen?
 - a. Canned fish should be stored where it won't freeze. There is no harm if the can does not burst or open in the seam. But freezing does break down the texture and the fish gets mushy.
9. How long may canned seafood be held in storage?
 - a. If properly sealed and processed it should last indefinitely.
 - b. But, the texture of salmon will become mushy and shellfish may become discolored.
 - c. Canned, smoked fish becomes dark and strong flavored if held more than one year, especially if it had a heavy smoke before canning.
10. Will frozen fish keep for years like canned fish?
 - a. No.
 - b. Frozen fish should be used within a year if stored at 0°F.; frozen crab and clams should be used within 3 to 4 months.
 - c. Use the very best moisture-vapor proof materials for wrapping. Fish and shellfish are the most sensitive meats frozen.
11. If a package of fish has thawed, can it be refrozen?
 - a. There is no serious harm, but the quality is lost.
 - b. Use it soon, or use it in a baked or cooked product and freeze this product.
12. What is the best method of storing herring for bait purposes?
 - a. Sort as to size; discard the cut, bruised, or poor ones.
 - b. Pack in plastic bags or waxed cardboard containers flooded with chilled water. Freeze the herring into blocks of the size needed for a fishing trip.
 - c. Herring frozen in this manner will last for 6 months or longer.
13. Should frozen fish be thawed before cooking?
 - a. Not necessarily, but add extra cooking time to take care of the thawing.
14. Do fish give an odor to the freezer and other food in the freezer?
 - a. No, not if the cleaning and wrapping job is done right and the temperatures are kept at 0°F. or lower.

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